EFFICACY OF PLAY BASED OCCUPATIONAL THERAPY IN ATTENTION DEFICIT HYPERACTIVITY DISORDER

A PROJECT WORK SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF OCCUPATIONAL THERAPY

(ADVANCED O.T. IN PAEDIATRICS)

Submitted by

Reg. No. 411613051

JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION COLLEGE OF OCCUPATIONAL THERAPY

KOMARAPALAYAM - 638183

Affiliated to

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI-600032

MAY– 2018

EFFICACY OF PLAY BASED OCCUPATIONAL THERAPY IN ATTENTION DEFICIT HYPERACTIVITY DISORDER

A PROJECT WORK SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF OCCUPATIONAL THERAPY

(ADVANCED O.T. IN PAEDIATRICS)

Submitted By

Reg. No. 411613051

JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION COLLEGE OF OCCUPATIONAL THERAPY

KOMARAPALAYAM-638183.

Affiliated to

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI-600032

MAY– 2018

PRINCIPAL EXTERNAL EXAMINER

GUIDE INTERNAL EXAMINER

ACKNOWLEDGEMENT

I am deeply indebted to the **ALMIGHTY** for his abundant grace and unseen guidance bestowed upon me in all my endeavours.

I express my sincere thanks to **Dr. J.K.K.MUNIRAJAHH, M. Tech (Bolton)**, Correspondent **J.K.K. MMRF** College of Occupational Therapy for granting me this opportunity to complete my Masters' in Occupational Therapy in his prestigious institution.

I express my deep sense of gratitude to **Mr. T. JEGADEESAN, M.O.T, M.Sc. (Psy),** Principal, **JKKMMRF** College of Occupational Therapy for his valuable guidance, encouragement and concern at every point which has been the driving force to complete this dissertation.

My special thanks to my Clinical Guide **Dr. VANATHI BALACHANDRAN, MD, PAEDIATRICS**, Assistant Professor, JKKMMRF College of Occupational Therapy.

My sincere thanks to **Mr. K. DHANAPAL, Statistician**, **JKKMMRF** College of Occupational Therapy for his valuable guidance.

It is my great pleasure and privilege to record my sincere thanks to **The Director, Occupational Therapy Foundation, Erode,** for her support to make the study a great success.

I extend my thanks to **All the College Staffs, Department Faculty Members, Office Staffs** and **Librarian, JKKMMRF** College of Occupational Therapy who supported me to complete the project.

I express my thanks to all the **parents** and **children** who participated in this study.

Finally, I take this opportunity to thanks my **batch mates**, **friends, parents, wife and children** who extended their constant support and encouragement.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF GRAPHS

“Play is the highest expression of human development in childhood, for it alone is the free expression of what is in a child’s soul.”

Friedrich Froebel.

ABSTRACT

OBJECTIVE

The purpose of the study is to examine the Efficacy of Play Based Occupational Therapy (PBOT) interventions in Adaptive Behavior of children with Attention Deficit Hyperactivity Disorder (ADHD).

METHODS

A total of 30 male and female subjects in the age group of 4 to 8 years participated in the study who were allocated as 15 in the experimental group and 15 in the control group.

RESULTS

Post-test data of the control and experimental groups in terms of mean values are 73.20 and 85.40 respectively. The “t” value is2.2794 and the “p” value is 0.0305 which is lesser than 0.05 indicating a significant statistical difference in the experimental group when compared to the control group with regard to Efficacy of Play Based Occupational Therapy interventions.

CONCLUSION

Play Based Occupational Therapy has a significant effect on improving Adaptive Behavior of children with ADHD.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a widely discussed issue in western contexts and developed countries. In contrast, limited information is available about ADHD in eastern contexts and developing countries. In India in particular, the only available information is about the medical perspective of ADHD; little or no attention is given to social or educational perspectives.[33]

The Keralian mainstream schools showed that 3% of the children had ADHD, more with inattention than hyperactivity characteristics, a higher number being from lower socio-economic backgrounds and teachers using coercive methods of physical punishments and interpreting the children's ADHD characteristics as a result of their lack of interest in learning.[33]

A cross sectional study of primary school children in Coimbatore district found a prevalence of 11.32% which was higher among the males (66.7%) than females (33.3%). The prevalence among lower socio-economic group was16.33% and among middle socio-economic group was 6.84%. The prevalence was highest in the age group of 9 and 10years.[54]

A cross sectional study among school going children in Bengaluru (5 to 12 years) found a prevalence of 1.3%. Male to female ratio was 1.6:1, children in hyperactivity type were 34.1%, inattention was 9.8% and combined type was 56.1%.[48]

ADHD can lead to considerable secondary problems in the children such as low academic achievement, retention in grade, conduct and emotional problems and impaired social competence as they progress into adolescence and young adulthood.[28]

Deficits in executive functions (response inhibition, working memory, cognitive flexibility and design fluency) may be a central feature of ADHD.[46]

Impact of co-occurring ADHD on the health-related quality of life (HRQoL) of children with specific learning disability (SpLD) was significantly poorer in four domains: emotional impact on parents, general behavior, time impact on parents, self-esteem and in overall psychosocial functioning.[34]

Comorbidities definitely influence the level of self-esteem (especially social domain) in children with ADHD when the severity of ADHD is higher and duration is longer.[44]

Many children with ADHD (5 to 12 years) may have various kinds of communication difficulties, even if they do not have a diagnosed language disorder.[53]

Symptoms of inattention and hyperactivity frequently co-occur with language difficulties. Impairments in executive function give rise to both behavioural and social communication problems, and additional or alternative deficits in other cognitive abilities.[27]

Early identification and treatment prevents or minimizes many of the negative effects of the disorder. The evaluation and management of a child with ADHD involves a multi- disciplinary team effort.[45]

Healthcare providers have used a variety of interventions in children identified with ADHD, such as psychotropic medication, behavioral interventions in the schools, and parent education.[31]

Multimodal intervention was found to be promising in the treatment of ADHD in children of 5 to 10 years.[30]

Multimodal intervention i.e. medication along with behavioral modification therapy, occupational therapy and Cognitive Behavior Therapy (CBT) given to children with ADHD was found effective in treating them.[38]

Many practitioners utilize different interventions. One such intervention is play therapy. Practitioners have utilized play therapy with children and found it to be effective in improving children's behavioral problems, social adjustment, and self-concept.[21]

Play therapy is an intervention designed to meet the development needs (communication and growth) of children through which they most naturally express their inner selves.[10]

Various theoretical approaches to play therapy have found that humanistic (child-centered play therapy being more effective and being a common approach) and non-humanistic approaches are effective.[21]

Play therapy treatments have been utilised as the primary intervention or as an adjunctive therapy for multiple mental health conditions and concerns such as anger management, grief and loss, divorce and family dissolution, crisis and trauma, and for modification of behavioural and emotional disorders, such as anxiety, depression, ADHD, autism or pervasive developmental, academic and social developmental, physical and learning disabilities and conduct disorders.[47]

OPERATIONAL DEFINITIONS

Adaptive Behavior

Adaptive Behavior is an ability to cope with environmental changes, to learn new everyday skills and to demonstrate independence. It is a composite of various domains as follows

- Communication which evaluates receptive, expressive and written ability
- The Daily Living Skills measures personal behavior as well as domestic and community interaction skills
- The Socialization covers play, leisure time, interpersonal relationships and various coping skills
- The Motor skills measures both gross and fine motor skills

Play Based Occupational Therapy

Play is considered to be a child's primary occupation which is essential in developing daily competence that can promote appropriate motor skills, stimulate imagination and enhance social skills. Play is used in Occupational Therapy in one of the two ways; as an explicit goal being addressed or as a modality to improve a specific skill or competency. Using this technique, therapists provide the child with challenges, with the intent to enhance particular skills in an environment which is non-threatening, enjoyable and protective.

NEED FOR THE STUDY

A vast literature supporting the efficacy of stimulant medication in the treatment of attention-deficit/hyperactivity disorder (ADHD) are available, however there is a clear need for effective psychosocial treatments to be identified.[24]

Play therapy is one such statistically viable intervention for children with various emotional and behavioral difficulties.[47]

Play therapy is the strategic use of play within the therapeutic context to promote specific therapeutic outcome.[5] Play based activities help to improve frontal lobe functions and there by inhibit the increased motor activities which ultimately facilitate social skills.[32]

AIM

The aim of the study is to examine the Efficacy of Play based Occupational Therapy in Adaptive Behavior of children with Attention Deficit Hyperactivity Disorder.

OBJECTIVES

- To assess the Adaptive Behavior of the children with ADHD
- To examine the effect of Play Based Occupational Therapy interventions in improving the Adaptive Behavior of children with ADHD

HYPOTHESIS

ALTERNATIVE HYPOTHESIS:

Play Based Occupational Therapy will have significant effect on improving Adaptive Behaviors in children with ADHD.

NULL HYPOTHESIS:

Play Based Occupational Therapy will have no significant effect on improving Adaptive Behaviors in children with ADHD.

RELATED LITERATURE

DEFINITION

Attention deficit hyperactivity disorder is one of the most common mental disorder affecting children. ADHD also affects adults. Symptoms of ADHD include inattention (not being able to keep focus), hyperactivity (excess movement that is not fitting to the setting) and impulsivity (hasty act that occurs in the moment without thought). **(American Psychiatric Association)**

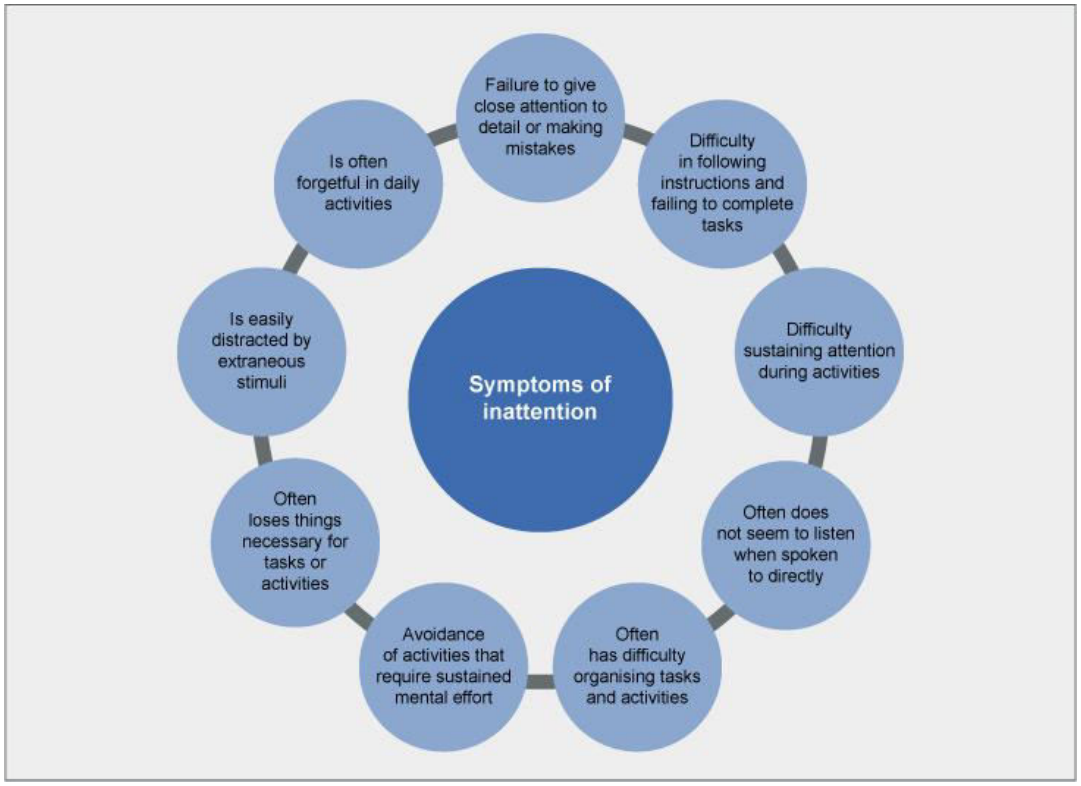
ADHD is a neurobehavioral disorder that affect 3-5 percent of all the American children. It interferes with a person's ability to stay at task and to exercise age appropriate inhibition (cognition alone or both cognition and behavioral). Some of the warning signs of ADHD include, failure to listen to instructions, inability to organize one self and school work, fidgeting with hands and feet, talking too much, leaving project, chores and homework unfinished and having trouble paying attention to responding details. **(National institute of Neurological disorder and Stroke)**

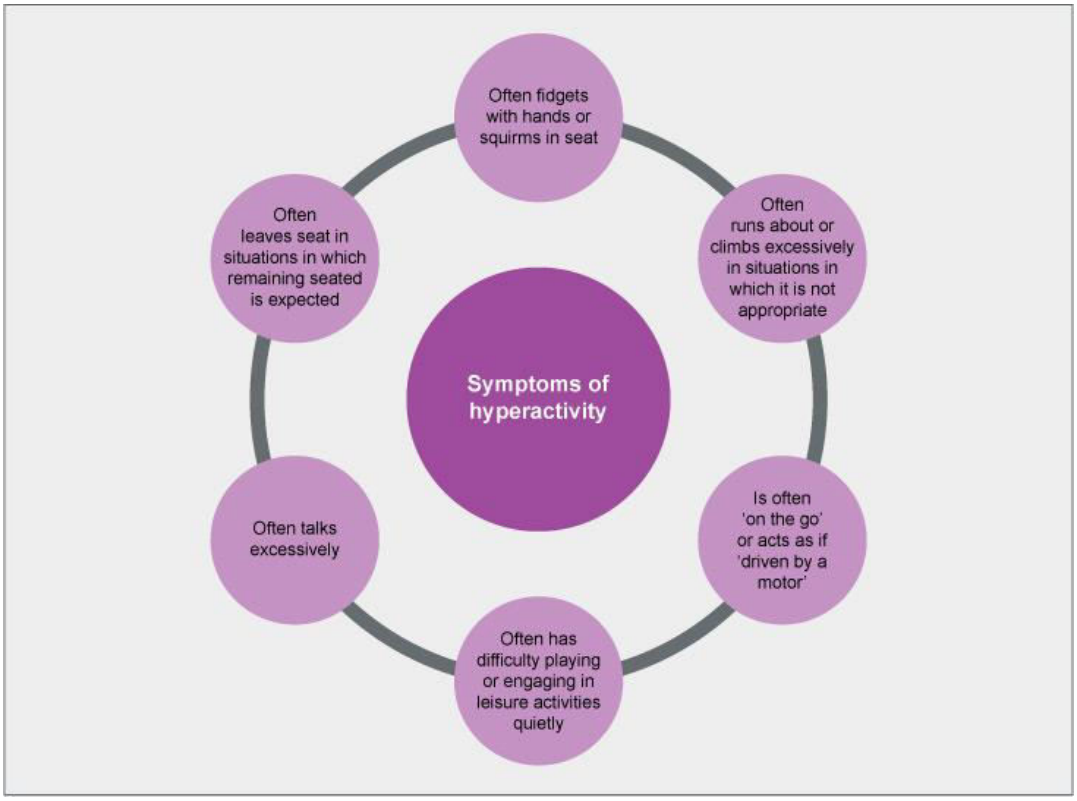
Neurodevelopmental disorders, including ADHD have undergone considerable diagnostic evolution in the past decade. In the United States, the current system in place is the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), whereas worldwide, the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) serves as a general medical system.

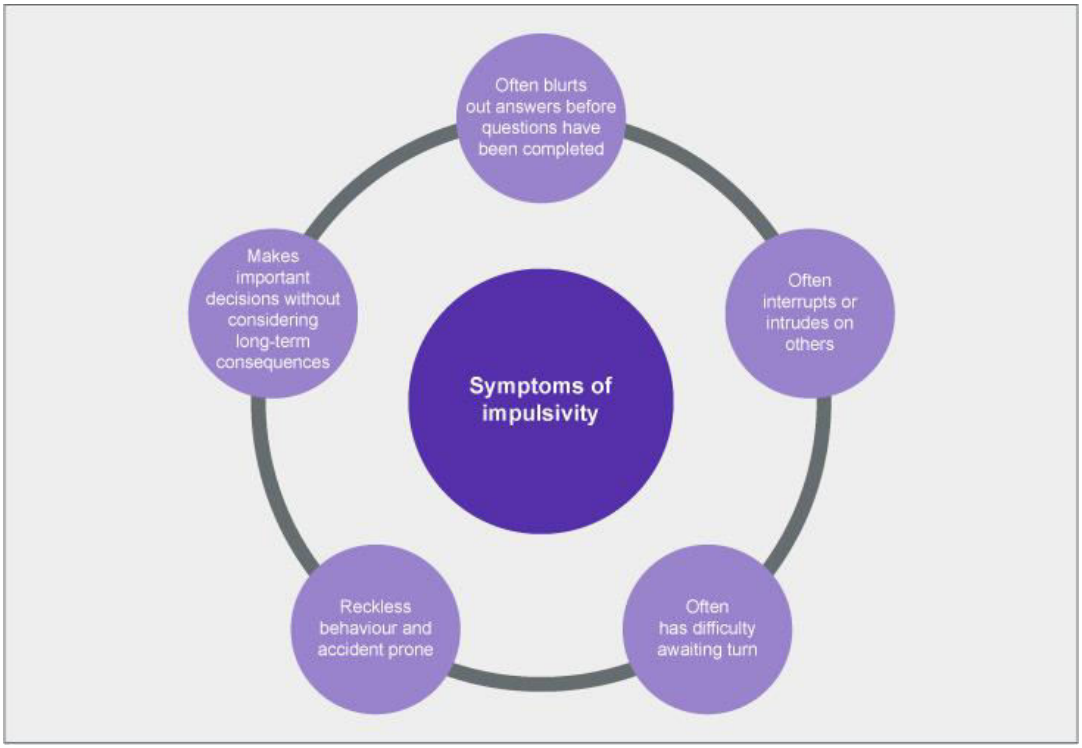
In the tenth edition of ICD-10the signs of ADHD are given the name "hyperkinetic disorders"(HKD). When conduct disorder is present, the condition is referred to as "hyperkinetic conduct disorder". Otherwise the disorder is classified as "disturbance of activity and attention", "other hyperkinetic disorders" or "hyperkinetic disorders, unspecified", "hyperkinetic syndrome."

The DSM-5 categorizes patients with ADHD by three main presentations: combined type, predominantly inattentive type and predominantly hyperactive-impulsive type, whereas the ICD-10 characterizes HKD by its ‘cardinal features’ of impaired inattention and overactivity.

A diagrammatic presentation of the symptoms of ADHD



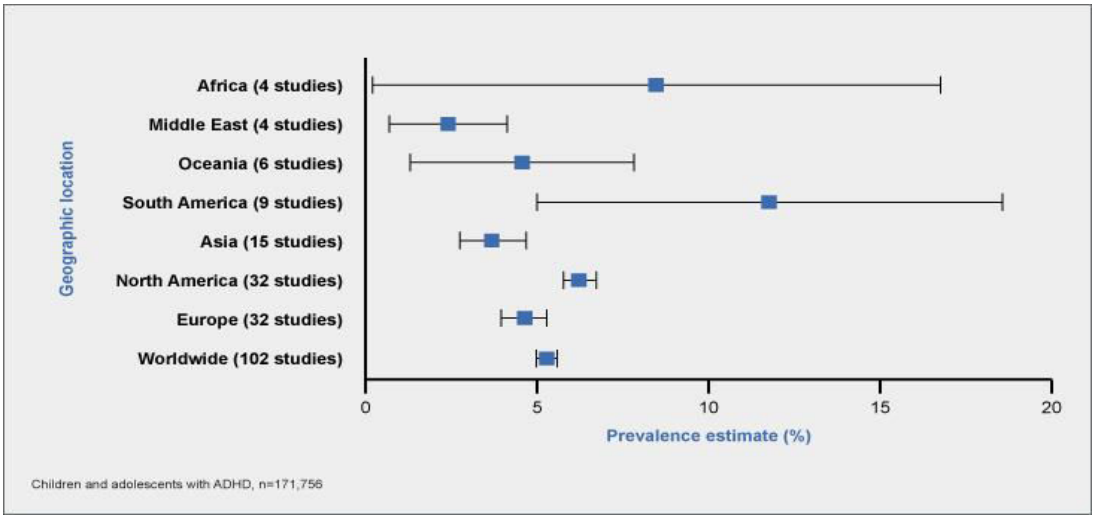

Symptoms of hyperactivity
Often fidgets with hands or squirms in seat
Often runs about or climbs excessively in situations in which it is not appropriate
Is often 'on the go' or acts as if 'driven by a motor'
Often has difficulty playing or engaging in leisure activities quietly
Often talks excessively
Often leaves seat in situations in which remaining seated is expected


Symptoms of impulsivity
Often blurts out answers before questions have been completed
Often interrupts or intrudes on others
Often has difficulty awaiting turn
Reckless behaviour and accident prone
Makes important decisions without considering long-term consequences

PREVALENCE

In India: The prevalence of ADHD among primary school children was found to be 11.32%, higher among males(66.7%) when compared to females (33.3%), in a study was conducted with the sample size of 770 children in the age group of 6-11 years.[54]

Although there is no global censes, meta-analysis have estimated the world-wide ADHD/HKD prevalence between 5.29% and 7.1%in children and adolescents and at 34% (range 1.2 to 7.3%) in adults. The prevalence of ADHD in very young children (Age <6years) (or) later in adult life (Age >44 years) is less well studied.



United States: National Health Interview Survey (NHIS) 2011-2013 found the following 9.5% of children aged 4 to 17 years were diagnosed with ADHD.

By age group:

2.7% of children aged 4 to 5

9.5% of children aged 6 to 11

11.8% of children aged 12 to 17

By Gender:

13.3% of boys

5.6% of girls

By Race/Ethnicity:

11.5% Non-Hispanic white children

8.9% Non-Hispanic Black children

6.3% Hispanic children

PATHOPHYSIOLOGY

The exact pathophysiology of ADHD is not clear, however abnormalities in the functioning of the neurotransmitters, brain structure and cognitive function are associated factors.

Neurotransmitters:

Neurotransmitters such as dopamine and noradrenaline have been suggested as key players in the pathophysiology of the ADHD. A deficiency of neural transmission may be linked to the pathophysiology and the symptoms of the depressed dopamine activity have been associated with the condition.

Brain Structure:

The frontal and prefrontal region of the brain and possibly the parietal lobe and the cerebellum and deformation of the basal ganglia nuclei in children with ADHD are thought to be associated, as some research has shown that such children

tended to have altered activation of the brain when performing certain tasks. In general, children with more severe deformations tend to have worse symptoms.

Cognitive Function:

ADHD is also linked to some neurophysiological deficits and abnormalities in cognitive function, usually seen in the resting brain but the Default-Mode-Network (DMN) activity may be involved, that is key in the region of the brain used to process tasks. As a result, affected individuals are likely to have difficulties in regulating and maintaining attention.

Cognitive top-down executive function control is particularly important when individual is performing complex tasks that have high adaptation and effort demands. Abnormalities in this function may include slow or variable reaction times when performing certain tasks and an increase in the number of errors made.

CAUSES

ADHD is not a single pathophysiological entity and appears to have a complex etiology. Multiple genetic and environmental factors act together to create a spectrum of neurophysiological lability.

1. **Genetic Factors:** Genetic factors are important in ADHD, but the mechanism of action is not completely understood. Twin, family and adoption studies of ADHD supported a strong genetic contribution of the disorder, with heredity range from 60 to 90%.A large majority of ADHD cases may arise from a combination of various gene including DRD4, DRD5, SLC6A3, SNAP-25 and HTR1B and chromosome such as 5p13,6q12,16p13,17p11 and 11q22-25.

2. **Environmental factors:**

Prenatal factors are associated with the maternal life style during pregnancy. e.g., prenatal alcohol exposure is known to induce brain structural anomalies especially in the cerebellum. Children become hyperactive, disruptive, impulsive and have an increased risk of psychiatric disorder. Maternal smoking is associated with hyperactivity in children. This may be due to an effect on nicotine receptor, which modulate dopaminergic activity.

Perinatal complications such as very low birth weight and maternal complications are also reported

Postnatal complications such as malnutrition and imbalance in essential fatty acids (Omega-3 and Omega-6), iron deficiency, food additives and lead contamination also have significant effects.

3. **Gene-Environmental Interaction:**

Recent studies have focused on the joint effect of gene variants (DRD4, DAT1) and prenatal substance exposure on subtypes of ADHD children, demonstrating that smoking during pregnancy is associated with the combined ADHD type in generally susceptible children

4. **Diets:** Studies have found that malnutrition is also correlated with attention deficit. Many studies point to synthetics, preservatives and artificial coloring agents aggravating ADD & ADHD symptoms in those affected.

5. **Brain Injuries:** Some children who have suffered accidents leading to brain injury may show some signs of behavior similar to that of ADHD, but only a

small percentage of children with ADHD have been found to have suffered a traumatic brain injury.

6. **Sugar:** Dr Benjamin Feingold, Lendon Smith, and Doris Rapp have been advocates of sugar, food allergy and food additives causing ADHD

7. **Social factors:** There is non-compiling evidence that social factors alone can create ADHD. ADHD does not stem from the home environment, but from biological causes. Some studies showed it may due to dysfunction in family life or inadequate educational system. Research has found no evidence that ADHD is caused by poverty or poor parenting.

MANAGEMENT

The therapeutic approach to ADHD has been shifting. For children 6 years of age and older, the American Academy of Paediatrics (AAP) recommends both behaviour therapy and medication as good options, preferably both together. For children under 6 years of age with ADHD, behaviour therapy is recommended as the first line of treatment, before medication is tried. Good treatment plans will include close monitoring of whether and how much the treatment helps the child's behaviour, and making changes as needed along the way.

In some cases, environmental restructuring and behavioural therapy alone has been effective. Developments in Behavioural Parent Training (BPT) and Behavioural Classroom Management (BCM) have also proven useful. Furthermore, behavioural psychotherapy often is successful when used in conjunction with an effective medication regimen. The medications of choice are stimulants and for adults with ADHD stimulants represent the best first-line therapeutic option. For

related areas of functioning, such as social skills and academic performance, medications combined with behavioural treatments may be indicated.

ADAPTIVE BEHAVIOUR

Adaptive behavior reflects an individual's social and practical competence to meet the demands of everyday living. Behavior patterns change throughout a person's development, across life settings and social constructs, changes in personal values, and the expectations of others. It is important to assess adaptive behavior in order to determine how well an individual function in daily life: vocationally, socially and educationally.

Two major concepts of Adaptive behaviour

1. Adaptive behaviour is the degree to which the individual is able to maintain himself independently

2. Adaptive behaviour is the degree to which he or she meets satisfactorily the culturally imposed demands of personal and social responsibilities.

Three major domains of Adaptive behavior

1. Conceptual Domain: Language, Memory, Reading and Writing
2. Practical Domain: Activities of daily living and Occupational performance
3. Social Domain: Interpersonal relationship and obeying laws

In education, adaptive behavior is defined as that which (1) meets the needs of the community of stakeholders (parents, teachers, peers, and later employers) and (2) meets the needs of the learner, now and in the future. Specifically, these behaviors include things as effective speech, self-help, using money, cooking, and reading[16].

ADAPTIVE BEHAVIOUR IN CHILDREN WITH ADHD

Significant social adaptive dysfunction in children with ADHD warrants that the evaluation should include assessment of adaptive skills, and treatment planning should include the identification of social and adaptive deficiencies when therapeutic goals are established[49]

Children with ADHD less frequently apply the strategies "Cognitive Problem Solving," "Problem-Oriented Acting," "Mood Enhancement," "Reevaluation," and "Distraction" which reveals differences in terms of adaptive emotion regulation, and seeking social support. Children with and without ADHD specifically differ in their application of problem-oriented emotion-regulation strategies, especially those with co-occurring problems infrequently apply adaptive emotion regulation strategies[51]

PLAY

Play therapy is a systematic use of theoretical models to establish an interpersonal process wherein trained play therapists use the therapeutic power of play to help the client resolve psychosocial difficulties and achieve optimal growth and development (**Association of play therapy**)

Play therapy is the strategic use of play within the therapeutic context to promote specific therapeutic outcomes.[5] Play based activities help to improve frontal lobe functions and there by inhibits the increased motor activities which ultimately facilitate socially appropriate behavior[32]

STAGES OF PLAY DEVELOPMENT

Takata's Taxonomy of Play:

1. **Sensorimotor epoch (0 to 2 years):** play is autotelic with sensation and motion. Eg: Peekaboo, pat-a-cake, hide and chase, and imitation with care givers; dropping objects, container play, exploration of object properties, practice of new motor skills, simple problem solving.

2. **Symbolic Play epoch (2 to 4 years)**: symbolic and constructive play begins make-believe and pretend play, experiences represented in play. Then there is a shift from solitary to parallel play. Building simple constructions that represent another object or situation.

3. **Dramatic, complex constructive and pregame epoch (4 to 7 years):** A shift from parallel play to associative play begins, social participation is expanded where the child enacts daily experiences, social roles, and fairy tales and myths. Hand dexterity, creativity and verbal skills develop.

4. **Games epoch (7 to 12 years):** A fascination with rules of games develop where the child, masters rules and makes up new ones, takes risks, is concerned with peer status, friendship, sports and formal group activities.

5. **Recreational epoch (12 to 16 years):** Team work and cooperation begins, where the child engages in games that challenge skills, is competitive and realistic.

THE THERAPEUTIC NATURE OF PLAY

Axline summarized her concept of play therapy stating, "A play experience is therapeutic because it provides a secure relationship between the child and the adult, so that the child has the freedom and room to state himself in his own terms, exactly as he is at that moment in his own way and in his own time.[3]"

A comprehensive literature review of 82 play therapy research studies from 1942–2000 summarizes an emphasis on the effectiveness of play therapy with positive outcomes noted with each of the research areas, self-concept, behavioral adjustment, social skills, emotional adjustment, intelligence, and anxiety/fear as topics of most significance regarding the efficacy of play therapy[25]

The establishment of the Association for Play Therapy (APT) in 1982 was a major advancement in the field of play therapy. The Center for Play Therapy, which has become the largest play therapy training program in the world, was established in 1988 in the University of North Texas.[47]

TECHNIQUES OF PLAY THERAPY

1. **Psychoanalytic Play Therapy:** Anna Freud and Melanie Klein wrote extensively about how they incorporated play into their psychoanalytic technique where the primary goal is to help the child develop an insight and work through their trauma

2. **Release or structured Play Therapy**: This is in contrast to the non-structured and non-directive approaches to play therapy, where a directive and active role in planning the play therapy process is assumed.

3. **Client-centered Play Therapy:** Axiline created a child or client centered play therapy based on Rogers's non directive therapy principles which emphasizes the facilitative role of the therapist including the qualities of genuineness, unconditional positive regard and empathic understanding.

4. **Family Play therapy or Filial Therapy**: Developed by Bernard and Louise Guerneyin the early 1960s which combines elements from play and family therapies in addition to the methods of adult education. This technique includes parents, children and a therapist together in a pre-planned play situation.

5. **Sand Play Therapy:** Lowenfeld's Sand tray or Sand box Therapy is a form of experiential workshop that explores deep emotional issues which is suitable for children and adults and allows them to reach a deeper insight into and resolution of a range of issues in their lives such as deep anger, depression, abuse or grief.

6. **Cognitive-behaviour Play Therapy:** Knell introduced the concept of cognitive-behavioural play therapy (CBPT) in which cognitive and behavioural interventions are incorporated within a play therapy paradigm.

Sarah K. Nielsen et.al (2017)[55] This systematic review examined evidence published in 2005–2015 for occupational therapy interventions for children with ADHD. 590 abstracts with 17 full-text articles were reviewed. Fourteen articles were included in the final analysis. Occupational therapy interventions focused on play, sensory, motor, and cognitive skills. While the interventions yielded good results, there were limitations in study design, interventions, and outcome measures suggesting future research to include larger sample size, randomization, control groups, and interventions.

El-Nagger et.al, (2017)[41] conducted a study to evaluate the effect of play therapy on children with ADHD. The sample size was 40 pre-school and school children with ADHD. Conner's Abbreviated parents and teachers rating scale, Children's Symptom Inventory (CSI-4) parents and teachers form scale and Vanderbilt ADHD parent and teachers rating scale were used to collect data. The result revealed that play therapy had a positive effect on all the three ADHD symptoms and also emotional and behavior disturbances.

Balboni et.al, (2017)[29] conducted a study to identify the subsets of the VABS II that can discriminate children with ADHD or SLD from peers with typical development. The study compared 24 ADHD children, 61 elementary students with SLD and a control group. The results revealed that children with ADHD are different from the control group in the areas of listening, attention, expressing complex ideas and following instructions.

Zakershoshtari et.al (2016)[39] conducted a study to investigate the effectiveness of play therapy on reduction of the symptoms of ADHD children. The sample size was 20 children screened with Conner's rating scale. The result showed that there is a significant difference between the mean scores in pre-and post-tests.

Drewes, Athena & Schaefer, Charles (2015)[15] This article explores the mechanism of change underlying play therapy in order to understand the specific forces that cause therapeutic improvement in client. Based on the reviews and the experience of the clients the author identified 20 core therapeutic powers of play. Among those, these therapeutic powers are changing agents that includes client's attachment formation, self-expression, emotional regulation, resiliency, self-esteem and stress management. The therapeutic powers of play transcend particular models of play therapy by defining treatment in terms of cross-cutting principles of therapeutic change seen within the client's treatment.

Shelby, Janine et.al (2015)[14] examined the complexities of contemporary play therapy, including what it is, why it has been difficult to define, and how these issues pose challenges to play therapy researchers. It also examines play therapy's evidentiary base, and addresses the key points. Play therapy's heterogeneity and the dearth of empirical work to identify common elements and key ingredients pose ongoing challenges for researchers as well as for therapists. Nevertheless, there is research to support several uses of play therapy. When dyadic treatments are included, the research merits increased confidence. Play therapy research has made substantial methodological advances in the past decade, and play therapy's empirical future is optimistic.

Miranda, Ana & Berengure et.al (2014)[40] conducted a study to examine the adaptive functioning in daily lives of adults with and without ADHD. The sample size was77 children of 17 to 24 years age group (40 with the clinical diagnosis of ADHD in childhood and 37 were control group). Weiss Functional Impairment Scale, Weiss Symptom record and Conner's Adult ADHD Rating Scale was used to collect data. The result revealed ADHD symptomatology as a whole predicted significant difference in the family environment, self-concept, life skills and academic functioning. The comorbidities mainly affected the family and risky activity domains (dangerous driving, illegal behaviors, substance misuse and sexually inappropriate behavior.

Lindbland, Ida & Svensson et.al (2013)[36] conducted a study to compare adaptive functioning in children with Mild intellectual disability (33) and ADHD (27). Adaptive behaviour Assessment system (ABAS-II) was used to collect data. The results revealed that the ADHD group had lower adaptive functioning (more significant in children older than 12 years) but the difference was not significant at total group levels.

Choi, Jin-Ah et.al (2012)[23] analyzed the research literature on play therapy intervention for children with ADHD. 39 studies from 1995 to 2010 were included. The results revealed, that the most commonly studied subjects were elementary school children with ADHD tendency, intervention duration 11 to 15 sessions of Game play therapy, CBPT, Child centered play therapy and Sand play therapy were mostly used amongst which the Game play therapy and CBPT are effective to reduce ADHD symptoms.

Barzegary et.al (2011)[18] A study examining effect of play therapy on ADHD using randomized sampling, among ADHD boys placed in 2 groups (experimentation and control group). CSI-4 questionnaire was performed by parents as pre and post- test. Using of covariance analysis, results showed that there is significant difference between control and experimental group.

Wilkes-Gillanet.al (2011)[55] A study aimed to examine the efficacy of a new intervention designed to improve the play and social skills of children with ADHD and their playmates within the natural context of play included children (aged 5-11 years) diagnosed with ADHD. The intervention involved seven weekly video-recorded free-play sessions; video feed-forward/feedback and therapist- and peer-modelling were used to promote social play. The Test of Playfulness was used as a pre-/post-test measure. Results support the use of play, video feed-forward/feedback techniques, therapist- and peer-modelling and parent involvement as an effective means to develop the social play skills of children with ADHD. Further larger-scale research is required.

Berhannu et.al (2011)[20] conducted a study to investigate if play therapy can facilitate the self-healing process, to improve academic performance, increase the attention level and to ensure self-esteem and self-confidence of children under difficult circumstances. The Goodman's Strengths and Difficulties Questionnaire were used to obtain data from 17 samples. The result revealed there is a significant difference between the pre-and the post test.

F, Naderi et. al (2010)[42] examined the Efficacy of Play Therapy on Attention Deficit Hyperactivity Disorder (ADHD), Anxiety and Social Maturity in 8-12 years

old male and female children. 80 boys and girls were allocated to experimental and control group. The results authenticated that play therapy as an effective therapeutic procedure is a conceivable intervention for children experiencing a broad range of problems such as ADHD and anxiety involving no any significant risk.

Cordier et.al (2009)[55]; conducted a study to propose a model to depict that interactive process between the characteristics of ADHD and factors promoting play. The sample size was 350 children (n = 112 ADHD paired with 112 playmates compared with 126 typically developing children). The finding suggests difficulties in the social play and lack of interpersonal empathy of the play in children with ADHD. The revised model emphasises the importance of interpersonal empathy and consideration for including playmates in the intervention process.The principles emphasise the importance of capturing the motivation of children with ADHD, counteracting the effects of lack of interpersonal empathy, and considerations for including playmates in the intervention process.

Jaak Panksepp et.al (May 2007)[32] found that the diagnosis of attention deficit hyperactivity disorders (ADHD) has been increasing at an alarming rate, paralleled by the prescription of highly effective psychostimulants that affect the growing brain and diminishing availability of opportunities to engage in natural self-generated social play.

Clark, Cheryl & Prior et.al (2002)[22] conducted a study to find if specific domains of adaptive behaviours and academic achievement depend on executive function capacities. Executive function deficits have been found to be associated with ADHD, not ODD/CD. On 110 adolescents, comprising four groups, ADHD

only, co-morbid ADHD and ODD/CD, ODD/CD only, and a normal community control group, socialisation and communication skills with the VABS, along with reading ability, and executive functioning were assessed. Poorer adaptive communication skills were specifically associated with ADHD and the social competence of adolescents with ADHD was as low. The verbal ability predicted communication and reading scores, with executive function abilities contributing significant variance to the prediction in the adaptive behaviour, communication, and socialisation domains.

Stein, Mark & Szumowski et.al (1995)[37] conducted a study to examine theadaptive function using VABS II in children with ADHD, ADD, and a psychiatric comparison group of children with PDD/mild MR. The results revealed that the adaptive functioning was well below average for all three clinic groups (The PDD/MR group had the lowest adaptive functioning scores, although not statistically different from the other groups). He found the level of adaptive functioning relative to IQ in the areas of Socialization, Communication and Daily Living was significantly lower for the ADD and ADHD groups that explains the poor long-term prognosis of ADHD, which recommends the requirement of increased attention to the assessment and treatment of adaptive functioning in individuals with ADHD and ADD.

METHODOLOGY

Research design

Quasi experimental design

Occupational Therapy Intervention
Control group (Pretest) ---------- Post Test

OT Intervention + Play Based OT
Experimental group (Pretest) ---------- Post Test

Variables under the study

Independent Variable : Play Based Occupational Therapy

Dependent Variable : Adaptive Behavior of ADHD children

Study Duration

Duration of the study is 1 year.

Study Setting

The study was conducted at "Occupational Therapy Foundation", Erode.

Sample size: (30 subjects)

- 15 subjects for control group.
- 15 subjects for experimental group.

Sampling technique:

Convenience sampling was adopted.

Inclusion Criteria

- Children diagnosed with ADHD
- Children between the age group of 4-8 years.
- Children of both genders

Exclusion criteria

- ADHD children who are speech and hearing impaired.
- Children with physical and mental challenges (e.g., cerebral palsy, and mental retardation).
- Children who are receiving other forms of therapy such as Behavior therapy, Dance and Music therapy and Pharmacological therapy.

MEASUREMENT TOOL

- Vineland Adaptive Behaviour Scale II (VABS II)

Description of scale

Table 1: Vineland Adaptive Behaviour Scale II (VABS II)

Author – Date	Sara S.Sparrow, Domenic V.Cicchetti and David A.Balla /2005
Standardized Psychometric Properties	Yes Validity: 0.87; Reliability: 0.97
Instrument Type	Parent/Caregiver Rating Form
Administration Environment	The VABS II Parent/Caregiver Rating forms are completed by parent and caregiver with paper-and-pencil at their convenience. Therapy setup, Classrooms, home based intervention, and family-focused intervention
Domains	It has 5 Domains • Adaptive Behavior Composite • Communication • Daily Living Skills • Socialization • Motor Skills
Subdomains	• Receptive • Expressive • Written • Personal • Domestic • Community • Interpersonal relationship • Play and leisure time • Coping Skills • Gross motor • Fine motor

PROCEDURE

For the current study a total of 30 subjects were selected using convenient sampling. The subjects were selected from the age group of 4-8 years.

The 30 subjects were then divided into two groups, a control group and an experimental group using lottery method. Both the groups consisted of 15 subjects each.

The control group receives only Occupational Therapy Management and the experimental group receives Play Based Occupational Therapy (PBOT) along with Occupational Therapy Management.

The pre-test data from both the groups was collected usingVABS II before the intervention phase was initiated. VABS II was used to assess the Adaptive Behaviour in children who were selected.

PBOT for the experimental group was initiated after the completion of Occupational Therapy intervention. A total of 24 play activities were chosen. Two play activities were repeated in three consecutive sessions followed by the next two activities in the subsequent sessions. The group was given intervention for 3 months duration in which each session lasted for 45 minutes. A total of 36 sessions were held (3 sessions per week i.e., 12 sessions per month).

Post test data was collected using the VABS II after the completion of the intervention sessions for both the groups.

INTERVENTION SESSIONS

Experimental group

First session - 45 minutes

Weekly - 3 sessions

Monthly - 12 sessions

Total - 36 sessions

Table 2: Intervention sessions

Sessions	**Duration**	**Play Activity**
1-3	1st month/1st week/2:15 hours	Name Game, Catching balloon
4-6	1st month/2nd week/4:30 hours	Bubble breath, Leap the Shoes
7-9	1st month/3rd week/6:45 hours	Tug of war, Wiggling Snake
10-12	1st month/4th week/9:00 hours	Rolling Children, Jump to colors
13-15	2nd month/5th week/11:15 hours	Stack the can, Throw the ball
16-18	2nd month/6th week/13:30 hours	Touch it, Target game
19-21	2nd month/7th week/15:45 hours	Balloon baseball, Be careful and throw the ring
22-24	2nd month/8th week/18:00 hours	Stop and Go, Penny flick
25-27	3rd month/9th week/20:15 hours	Balloon of Anger, Tel me act Tel me
28-30	3rdmonth/10th week/22:30 hours	Beat the clock, Slow motion game
31-33	3rd month/11thweek/24:45 hours	Work for longer time, Party hat on monster
34-36	3rd month/12thweek/27:00 hours	Worry can, Me and my shadow

Table 3: Vineland Adaptive Behavior Scale II

Sl.No	Adaptive Behavior Composite			
	Control Group		Experimental Group	
	Pre-test	Post-test	Pre-test	Post-test
1	87	88	66	79
2	65	65	67	80
3	80	80	61	83
4	96	96	74	89
5	82	82	83	92
6	84	84	82	98
7	80	81	85	94
8	98	98	94	101
9	57	57	82	93
10	46	46	68	86
11	60	60	85	87
12	67	67	100	109
13	74	74	56	63
14	58	59	45	59
15	61	61	61	68

TABLE: 4

COMPARISON BETWEEN PRE-TEST MEAN SCORES OF ADAPTIVE BEHAVIORS' COMPOSITEFOR CONTROL GROUP (CG) AND EXPERIMENTAL GROUP (EG).

Sl. No	Pre-Test	Mean	SD	Table Value	Calculated "t" Value	"P" Value
1	Control group	73.00	15.29	2.048	0.1684	0.8675
2	Experimental group	73.93	15.07			

GRAPH 1:

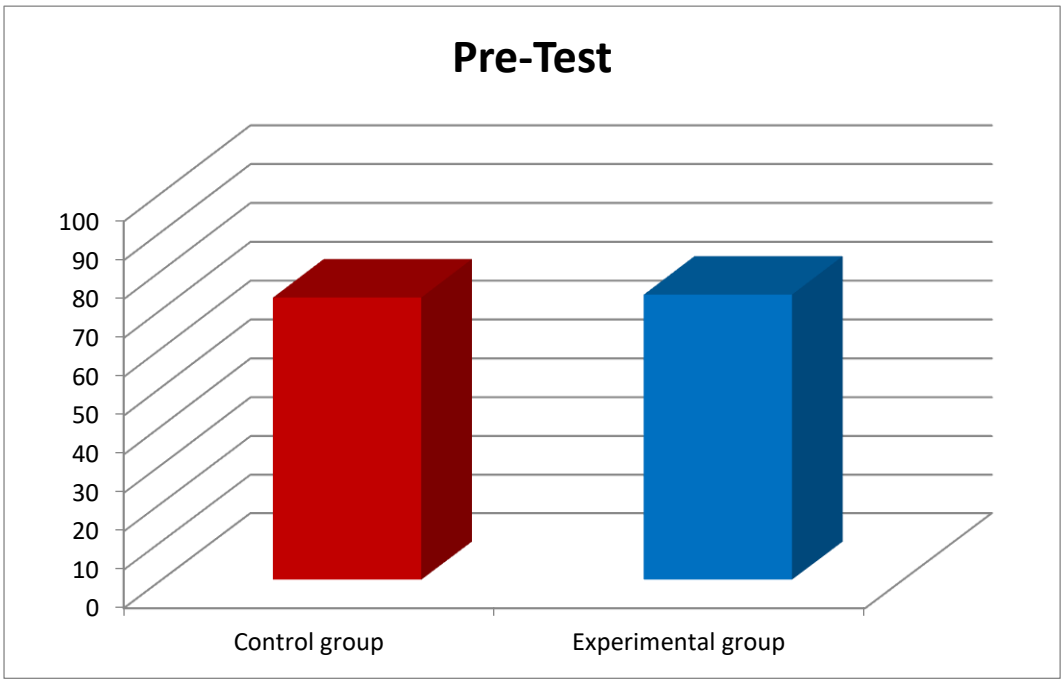


Table 4 shows the comparison of pre-test data between the control and experimental group. Pre-test mean values obtained were 73.00 and 73.93 respectively. The calculated "t" value is 0.1684 and "p" value is 0.8675 which is greater than 0.05 showing no significant difference between the groups.

TABLE 5:

COMPARISON BETWEEN PREAND POST MEAN SCORES OF ADAPTIVE BEHAVIORS' COMPOSITE FOR CONTROL GROUP

Sl. No	CONTROL GROUP	Mean	SD	Table Value	Calculated "t" Value	"P" Value
1	Pre-Test	73.00	15.29	2.145	1.8708	0.0824
2	Post Test	73.20	15.33			

GRAPH 2:

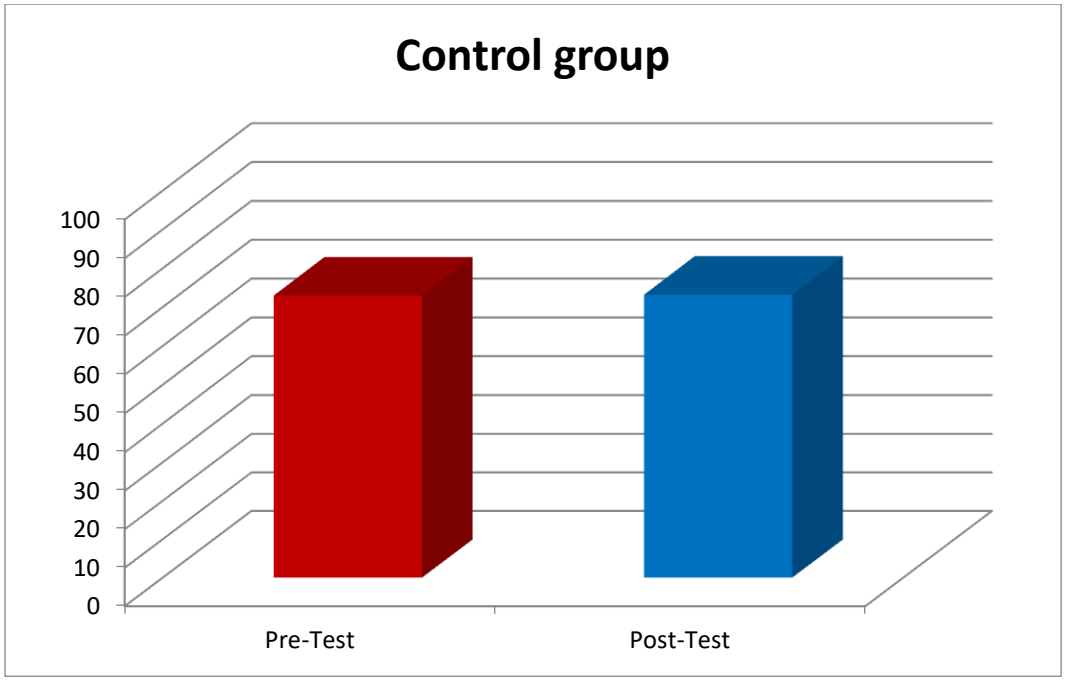


Table 5 shows the comparison between the pre and posttest data of the control group. The mean values obtained are 73.00 and 73.20 for pre and post-test respectively. The calculated "t" value is 1.8708 and "p" value is 0.0824 which is greater than 0.05 indicating no significant difference between pre and post test data.

TABLE 6 :

COMPARISON BETWEEN PRE-AND POST TEST MEAN SCORES OF ADAPTIVE BEHAVIOR COMPOSITE FOR EXPERIMENTAL GROUP.

Sl.No	Experimental group	Mean	SD	Table Value	Calculated "t" Value	"P" Value
1	Pre-Test	73.93	15.07	2.145	8.6889	0.0001
2	Post Test	85.40	13.96			

GRAPH 3 :

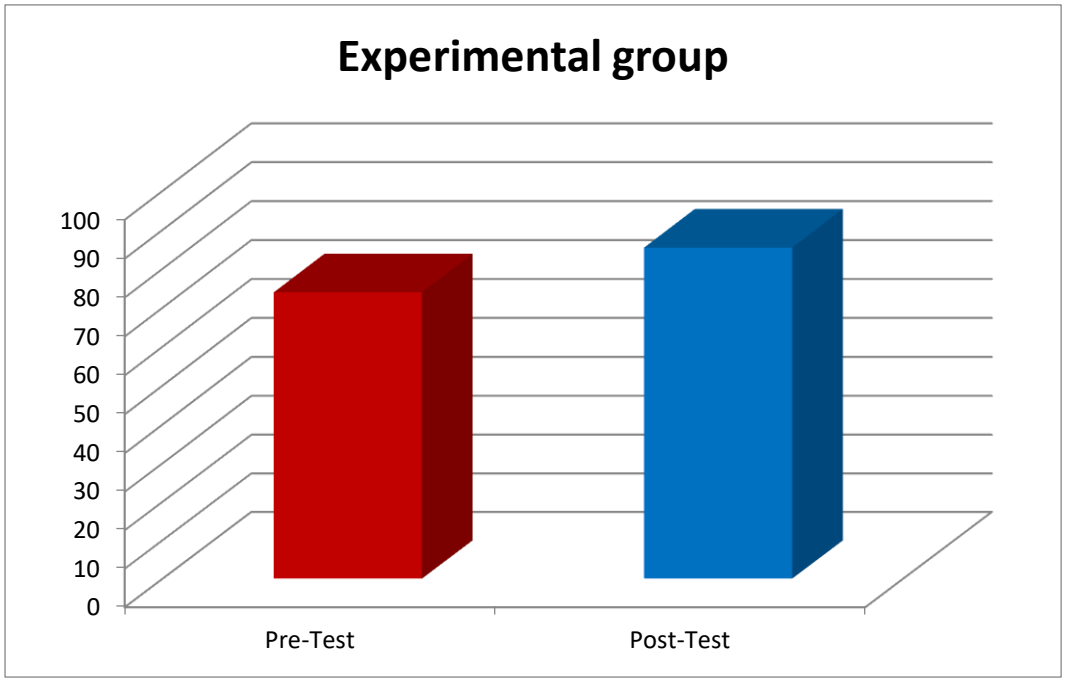


Table 6 shows the comparison between the pre and post test data of the experimental group. The mean values of pre and post test data are 73.93 and 85.40 respectively. The calculated "t" value is 8.6889 and table "t" value 2.145 at 95% confidence interval and 14df. The "p" value is 0.0001 which is lesser than 0.05 indicating a significant difference between pre and post test data.

TABLE 7:

COMPARISON OF POST TEST MEAN SCORES OF ADAPTIVE BEHAVIOR COMPOSITEFOR CONTROL GROUP EXPERIMENTAL GROUP

Sl. No	ADAPTIVE BEHAVIOR COMPOSITE	Mean	SD	Table Value	Calculated "t" Value	"P" Value
1	Post-test (CG)	73.20	15.33	2.048	2.2794	0.0305
2	Post-test(EG)	85.40	13.96			

GRAPH 4:

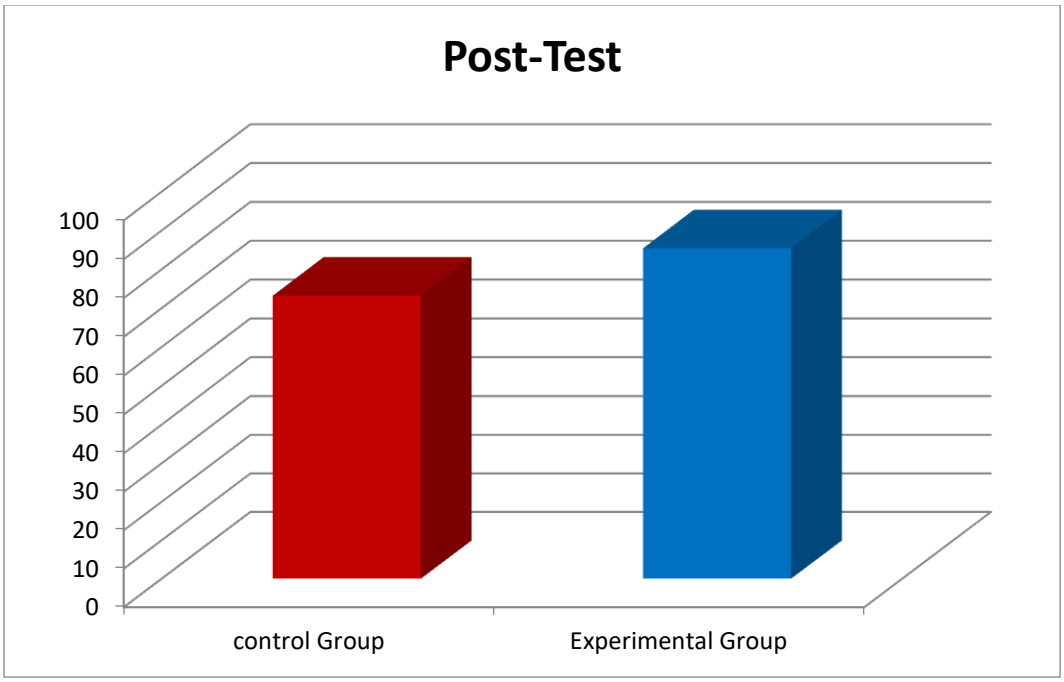


Table 7 shows the comparison of post test data between the control and experimental group. The mean values obtained are 73.20 and 85.40 for CG and EG respectively. The obtained "t" value is 2.2794 and the table "t" value is 2.048 at 95% confidence interval and 28df. The "p" value is 0.0305 which is <0.05 indicating a significant difference between the groups.

TABLE- 8:

COMPARISON BETWEEN PREAND POST TEST MEAN SCORES OF DOMAINS FOR EXPERIMENTAL GROUP

Domain	Mean	SD	df	Table Value	Calculated "t" Value	"P" value
Communication						
Pretest	73.33	19.55	14	2.145	6.6709	<0.0001
Post test	85.73	15.26				
Daily Living Skill						
Pretest	74.7	18.53	14	2.145	1.1295	0.2777
Post test	77.23	16.16				
Socialization						
Pretest	75.67	14.4	14	2.145	8.6582	<0.0001
Post test	93.67	13.67				
Motor skills						
Pretest	66	13.86	7	2.365	4.1413	0.0043
Post test	80	11.31				

GRAPH 5 :

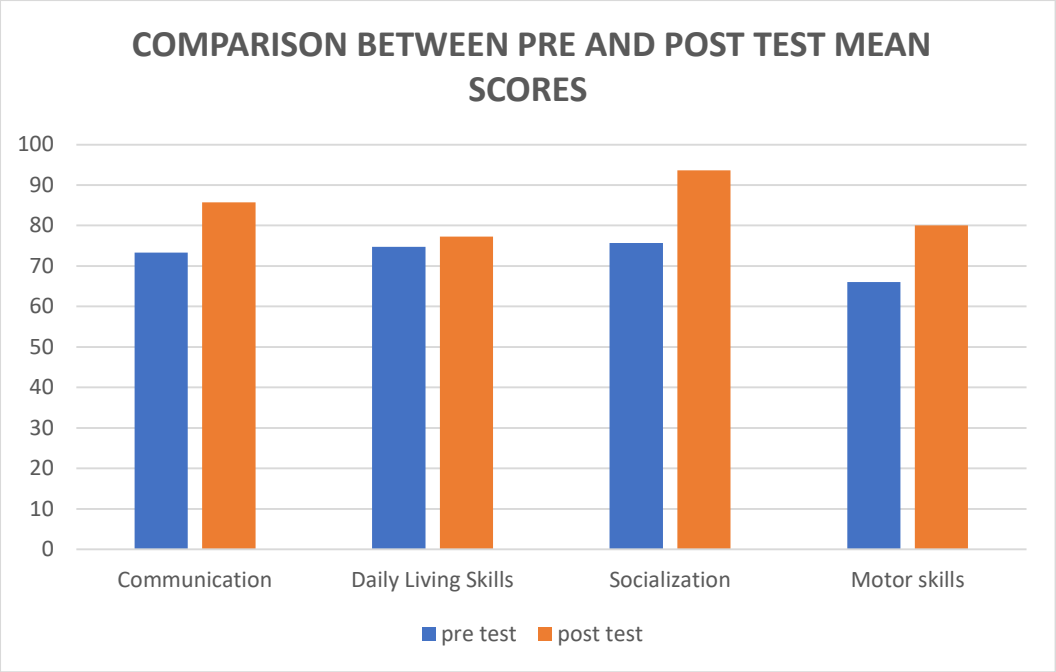


Table 8 shows the comparison between pre and post test mean scores of the Domains (Experimental group). The following values are obtained for the pre and post test data respectively: 73.33; 85.73, 74.7;77.23, 75.67; 93.67, 66; 80. The calculated "t" value of Communication, Daily living skills, Socialization and motor skills are 6.6709, 1.1295, 8.6582 and 4.1413 respectively at 95% confidence interval and the "p" values are <0.0001, 0.2777, <0.0001 and 0.0043. Significant differences are obtained in the Socialization, Communication and Motor skills. There is no significant change in the Daily living skills domain.

TABLE- 9: COMPARISON OF POST TEST MEAN SCORES DOMAINS OF FOR EXPERIMENTAL AND CONTROL GROUP

Domain	Mean	SD	df	Table "t" value	Calculated "t" Value	"P" value
Communication						
Post test (CG)	72.27	15.2				
Post test(EG)	85.73	15.26	28	2.048	2.4221	0.0222
Daily Living Skill						
Post test (CG)	74.33	15.81				
Post test(EG)	77.27	17.91	28	2.048	0.4755	0.6381
Socialization						
Post test (CG)	71.47	15.32				
Post test(EG)	93.67	13.67	28	2.048	4.1368	0.0003
Motor Skills						
Post test (CG)	83.43	12.53				
Post test(EG)	80	12.22	13	2.16	1.3952	0.1863

GRAPH 6 :

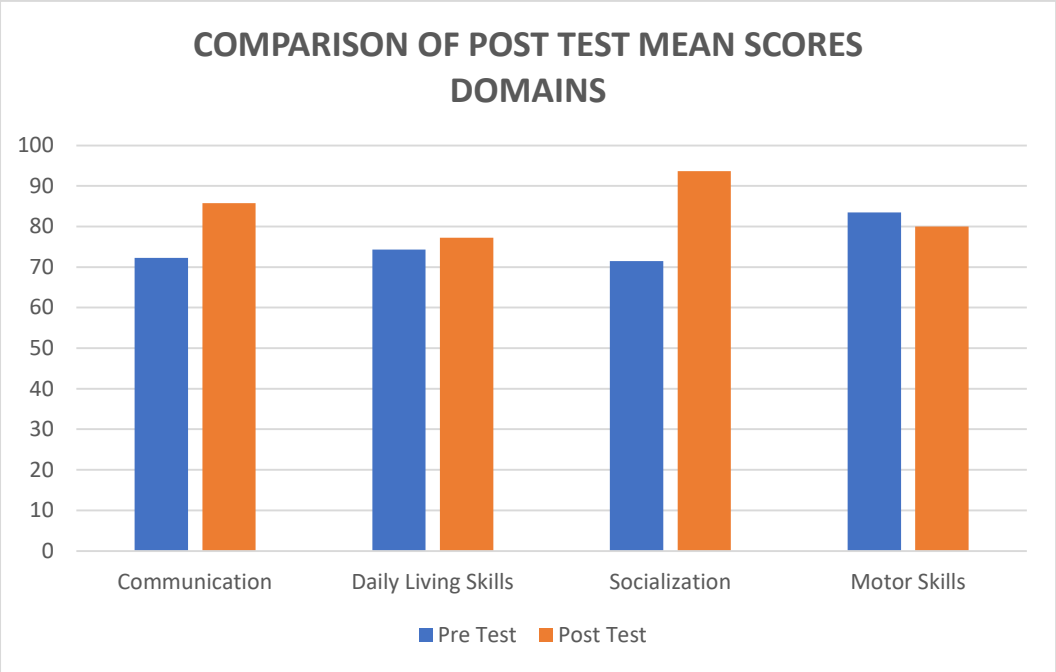


Table 9 shows the comparison between posttest mean scores of the domains (Control group and Experimental group) which are 72.27;85.73, 74.33;77.27, 71.47;93.67, 83.43;80 respectively. The calculated 't value of Communication, Daily living skills, Socialization and Motor skills are 2.4221,0.4755, 4.1368, 1.3952 respectively at 95% confidence. The "p" values are 0.0222, 0.6381, 0.0003, 0.1863. Therefore, significant differences are evident in the Socialization and Communication domains.

DISCUSSION

The purpose of this study was to examine the Efficacy of Play based Occupational therapy in ADHD children. The aim of the study was to understand the Effect of Play based Occupational therapy in Adaptive Behaviour of children with Attention Deficit Hyperactivity Disorder.

Participants were 30 male and female children who met the selection criteria who were then allocated to two groups (control and experimental) consisting of 15 children each.

The mean age of control group was 6.5 years and 6 years in experimental group. Pre-test for both the groups was done using Vineland Adaptive Behaviour Scale II (VABS). Subsequently the control group received Conventional Occupational Therapy and the experimental group received Play Based Intervention along with Conventional Occupational Therapy.

The duration of intervention was 45 minutes per session. A total of 36 sessions were conducted over a 3-month intervention period with12 sessions in a month.

A post- test was conducted using VABS II. Analysis of results after the completion of 36 sessions were done using paired and unpaired ‘t’ tests.

The comparison of pre-test data for both Experimental and Control group (Table 4) shows the mean scores73.00 and 73.93. Unpaired ‘t’ test value was 0.1684 and the P value was greater than 0.05, Hence there is no significant difference in the mean values of two groups showing homogeneity in terms of Adaptive Behavior of the two groups.

The comparison of pre and post test scores in the control group (Table 5) shows the mean scores of 73.00 and 73.20 respectively. The paired t test value was 1.8708 and the P value was greater than 0.05 indicating no significant difference.

The comparison of pre and post test scores in the experimental group (Table6) shows the mean scores 73.93 and 85.40 respectively. The paired t test value was 8.6889 and the P value was 0.0001 which is lesser than 0.05, Hence there is a significant difference in the mean value of the pre and post test data of the experimental group. These results are supported by a study conducted to evaluate the effect of play therapy on children with ADHD where the sample size was 40 preschool and school children with ADHD. The result revealed that play therapy had a positive effect on the symptoms of ADHD and also in emotional and behaviour disturbances **(El-Nagger et.al 2017)**

The comparison of post-test scores for both experimental and control group (Table 7) shows the mean scores of 73.20 and 85.40 respectively. The 't' value obtained was 2.2794 while the table value was 2.048 (calculated t value > table value) and the P value was 0.0305 which is lesser than 0.05 level of significance. Hence the Null Hypothesis which states that "Play Based Occupational Therapy will have no significant effect on improving Adaptive Behaviors in children with ADHD" is rejected.

The above is supported by a study conducted to examine the Efficacy of Play Therapy on Attention Deficit Hyperactivity Disorder (ADHD), Anxiety and Social Maturity. The results revealed that play therapy as an effective therapeutic

procedure is a conceivable intervention for children experiencing a broad range of problems such as ADHD and anxiety **(F, Naderi et.al 2010).**

In the experimental group the domains on VABS II such as Communication, Daily living skills, Socialization and Motor skills were also analyzed using paired 't' test. The pre and post test mean values of Communication, Daily living skills, Socialization and Motor skills were 73.33:85.73, 74.7;77.23, 75.67;93.67 and 66;80 respectively. The P values were <0.0001, 0.2777, <0.0001 and 0.0043. The findings shows that play based intervention has produced significant positive changes in Socialization, Communication and also in Motor skills. However, the Daily living skills domain did not show any significant differences.

Unpaired 't' test on the post test results in the experimental and control group domains including Communication, Daily living skills, Socialization and Motor skills gave the following results. The post test means of both control and experimental group (Table 9) shows 72.27;85.73, 74.33;77.27, 71.47;93.67, 83.43;80 respectively. The P values were 0.0222, 0.6381, 0.0003 and 0.1863.This finding shows that play therapy contributes significantly in improving the Socialization and Communication aspects with a higher level of improvement in Socialization when compared to Communication. However, there is no significant difference in Motor and Daily living skills.

In view of the above findings it is understood that Play based Occupational Therapy can bring about a significant improvement in the Adaptive Behavior of children with ADHD which warrants further research in this area.

CONCLUSION

From this study it is concluded that there is a significant improvement in Adaptive Behavior of the children with ADHD through Play based Occupational therapy.

LIMITATIONS AND RECOMMENDATIONS

LIMITATIONS

- A smaller sample size.
- Duration of therapy was shorter.
- The age group was restricted to 4 to 8 years of age.

RECOMMENDATIONS

- A larger sample size and longer duration of intervention could be considered.
- Variation in the age groups could be evaluated.
- Effect of different co-morbid conditions could be compared.
- Specific play therapy techniques should be designed which are inexpensive, enjoyable, easy to implement home and school based activities.
- Parent and teacher educational and training programs should be emphasized to increase the awareness and efficacy of play therapy which would encourage them to practice the same and bring about an enhanced quality of life.

REFFERENCES

Books

1. Attention deficit hyperactive disorder (ADHD); pediatric diagnosis and treatment guideline.

2. Attention deficit hyperactive disorder: diagnosis and management of ADHD children, young people and adults; Stephen V Faraone.

3. Axline VM. Play Therapy. New York: Ballantine Books, 1947.

4. Bhatia, M.S., Short text book of psychiatry: 4th edition.

5. Dale-Elizabeth Pehrsson, Ed.D. and Mary E. Aguilera, M.A. Play Therapy: Overview and Implications for Counselors. Professional Counseling Digest 2007.

6. Diagnostic and statistical manual of mental disorders- 5th edition.

7. Early Intervention Games: Barbara Sher, 2nd Edition.

8. Frame of reference for pediatric occupational therapy 2nd edition; Paula Kramer/ Jim Hinojo.

9. ICD-10 Classification of Mental and Behavioral Disorders.

10. Landreth, Garry L. Play therapy: the art of the relationship. Routledge Publication, 2012.

11. Occupational Therapy for Children and Adolescents; 7th edition; Jane Case-Smith.

12. Occupational therapy for children; 2nd edition; Pat Nuse Pratt, Anne Stevens Allen.

13. Play for Children with Special Needs: 2nd edition; Christine Macintyre.

14. Play Therapy Research: Issues for 21st Century ProgressKevin J. O'Connor PhD, Shelby, Janine.

15. The Therapeutic Powers of Play; Drewes, Athena & Schaefer, Charles.

16. VABS II Manual: 2nd edition Sara S. Sparrow, Domenic V. Cicchetti.

Journals

17. Barkley RA, Fischer M, Edelbrock CS, Smallish L. The adolescent outcome of hyperactive children diagnosed by research criteria: 1. An 8-year prospective follow-up study. Journal of American Academy of Adolescent Psychiatry 1990; 29: P-546-557.

18. Barzegary.L.Zamini.S, The Effect of Play therapy on Children with ADHD: WCPCG:Dec-2011, p-2017-2018.

19. Bratton, Sue & Ray, Dee. (2000). What the research shows about play therapy. International Journal of Play Therapy. 9. 47-88.

20. Berhanu Nigussie,Worku, Effectiveness of Play Therapy on self-healing and enhancing Life-skills of the Children under difficult circumstances. Ethiopia journal of education and science, Vol. 6 p-54.

21. Bratton, S.C. Ray, D Rhine, T, Jones, The efficacy of play therapy with children: A meta-analytic review of treatment outcomes. Professional Psychology: Research and Practice, Vol- 36, 2005, p- 376-390

22. Cheryl Clark, Margot Prior, Glynda J. Kinsella, The relationship between executive function abilities, adaptive behavior, and academic achievement in children with externalizing behavior problems, Vol-43, Issue-3, Oct-2002, P-785-796.

23. Choi, Jin-Ah, Literature Review of Play therapy Intervention for children with ADHD, Vol-50, Issue-5, 2012, p-125.

24. Chronis AM[1], Jones HA, Raggi VL. Evidence-based psychosocial treatments for children and adolescents with attention-deficit/hyperactivity disorder. Clinical Psychology Review. 2006 Aug;26(4):486-502.

25. Dee C. Ray, Schottelkorb, Mei-Hsiang Tsai, Play Therapy with Children Exhibiting Symptoms of Attention Deficit Hyperactivity Disorder April. International Journal of Play Therapy 2007, Vol. 16, No. 2,p- 95–111.

26. DuPaul, G., & Stoner, G. (2003). ADHD in the schools assessment and intervention strategies. New York: The Guilford Press.

27. Erin Hawkins, Susan Gathercole, Duncan Astle, The CALM Team, and Joni Holmes Paul E. Engelhardt, Language Problems and ADHD Symptoms: How Specific Are the Links?Brain Science. Vol-6, Issue-4, 2016 Dec, p- 50.

28. Fischer M, Barkley RA, Edelbrock, CS, Smallish L. The adolescent outcome of hyperactive children diagnosed by research criteria: II Academic, attentional, and neuropsychological status. J Consult Child Psychology Vol-58, 1990; p- 580-588.

29. Giuilia Balboni, Oriana, Carmen Belachi, Bonichini. Vineland-II adaptive behavior profile of children with ADHD or Specific Learning Disorders Research in Developmental Disabilities. Vol:61, February 2017, p - 55-65.

30. Gopalan Rejani & Oommen Anna & Srinath Shoba & Kapur Malavika. Efficacy of Multimodal Intervention for Children with Attention Deficit Hyperactivity Disorder (ADHD), An Indian Study. Journal of Behavioral and Brain Science. Vol-2, 2012, p-117-127.

31. George J. DuPaul, Asha K, Jitendra, Children with ADHD. Isthe gender difference in the school functioning? School psychology review, Volume-35, Issue-2, 2006, P-292-308.

32. JaakPanksepp PhD, Can PLAY Diminish ADHD and Facilitate the Construction of the Social Brain? Journal of Canadian Academy of Child Adolescent Psychiatry 16:2 May 2007, p-57-66.

33. Jament, J. Attention deficit hyperactivity disorder (ADHD) within a South Indian (Keralian) mainstream school context. Doctoral thesis, The University of Northampton (2009).

34. Karande Sunil & Bhosrekar Kirankumar (2009). Impact of attention-deficit/hyperactivity disorder on health-related quality-of-life of specific learning disability children. Indian journal of pediatrics. Vol-76. Issue24, p-1119.

35. Kimberley Docking and Natalie Munro, The University of Sydney, Australia Reinie Cordier James Cook University, Townsville, Australia Prudence Ellis, Child Language Teaching and Therapy. 2013 Article 292 Child Language Teaching and Therapy- 29**.**

36. Linalda, Svensson, Landgren. M, Nasic.S,Tideman.E, Mild intellectual disability(MID) and ADHD; A comparative study of school age children's adaptive ability, Acta Pediatric journal, Vol-102, Issue-10, Aug 2013, P-31.

37. Mark A. Stein/Emily Szumowski Tomas. A Blondis. Nancy Adaptive skills dysfunction in ADD and ADHD children,The Journal of Child Psychology and Psychiatry, Volume 35,Issue-4, May-1995, p-663-670.

38. Mhtare, Priti&Gajre, Mona &Karia, Sagar & Chheda, Nidhi & Saroj, Dinesh & Desousa, Avinash. Effect of multimodal therapy on children with attention deficit hyperactivity disorder. International Journal of Contemporary Pediatrics. Vol-4, Issue-2, 2017, p-495-498.

39. Maryam Zakershoshtari & Zahra Dasht Bozorg, The Effectiveness of Play Therapy on Reduction of the Symptoms of Attention Deficit Hyperactivity Disorder (ADHD) in Children, Asian Social Science; Vol. 12, No. 6; 2016.

40. Miranda, Ana , Berengure, Influence of the symptoms of ADHD and comorbid disorders on functioning in the adulthood, Vol-26, Issue-4, 2014, p-121.

41. Nahed Saied, El Nagger, Effect of play therapy on Children with ADHD, Journal of Nursing Education and Practice,Vol-7, Issue-5,jan 2017, p-104.

42. F, Naderi, A, Heidarie. L, Bouron. P, Asgari. The Efficacy of Play Therapy on ADHD, Anxiety and Social Maturity in 8 to 12 Years Aged Clientele Children of Ahwaz Metropolitan Counseling Clinics. Journal of Applied Sciences, Vol10, Issue 3, 2010, p-189-195.

43. Ordier.R, Bundy.A, Hocking.C, Einfields, A model for Play based intervention for children with ADHD, Australian Journal of Occupational Therapy, vol-56,Issue-5,Oct-2009,P-40.

44. Pradeep Palaniappan, Impact of Comorbidities on Self-Esteem of Children with Attention Deficit Hyperactivity Disorder. The International Journal of Indian Psychology, Volume 3,Issue 3, 2016, p-2349-3429.

45. Pratibha Singhi, Prahbhjot Malhi, Attention Deficit Hyperactivity Disorder in School Aged Children: Approach and Principles of Management, Indian Journal of Pediatrics Vol- 35, 1998, p- 989-999.

46. Preeti Sinha, MD, Rajesh Sagar, MD, Manju Mehta, PhD. Executive Function in Attention Deficit/Hyperactivity Disorder. Journal of Indian Association of Child Adolescent. Mental Health 2008; Vol- 4,Issue-2, p-44-49.

47. Raman, Vijaya & Singhal, Meghna. (2015). Play therapy with children: Its relevance and utility in the Indian context. Journal of Indian Association for Child and Adolescent Mental Health. 11. 121-157.

48. Ramya H, Goutham A, Lakshmi V Pandit, Prevalence of attention deficit hyperactivity disorder in school going children aged between 5-12 years in Bengaluru. Current Pediatric Journal, Vol-21, Issue-2, 2017, p-321-326.

49. Roizen NJ1, Blondis TA, Irwin M, Stein M. Adaptive functioning in children with attention-deficit hyperactivity disorder. Arch Pediatric Adolescent Medicine.1994 Nov; 148(11):1137-42.

50. Sasah K. Nielsen, Kamela Kelsch, Kaci Miller. Occupational therapy intervention for Children with Attention Deficit Hyperactivity Disorder: A systematic Review; Occupational therapy in Mental Health. Vol: 33, 2017-Issue-1.

51. Schmitt, Kathrin & Gold, Andreas & Rauch, Wolfgang. (2012). Deficient adaptive regulation of emotion in children with ADHD. Kinder and Psychiatric and Psychotherapy. 40. 95-102.

52. Tara. M. Hall, Charles E. Schaefer, Fifteen effective Play therapy technique. Professional Psychological research and Practice, Vol-33, Issue-6, Dec-2002, p- 515-522.

53. Vaisanen, Raija, Loukusa, Soile & Moilanen, Irma, Yliherva, Anneli Language and pragmatic profile in children with ADHD measured by Children's Communication Checklist. Logopedics, phoniatrics, vocology. Vol-39, Issue-4, 2014, p-179-187.

54. Venkata JA, Panicker AS. Prevalence of attention deficit hyperactivity disorder in primary school children. Indian Journal of Psychiatry, Vol;-55, 2013; 55:338 p-42.

55. Wilkes-Gillan, Sarah, Cordier, Reinie & Bundy, Anita, Docking, Kimberley, Munro, Natalie. A play-based intervention for children with ADHD: A pilot study. Australian occupational therapy journal. Vol-58, Issue-4, 2011, P-231.

Ph: 0091 - 04288 - 260032, 260588

J.K.K.MUNIRAJAHH MEDICAL RESEARCH FOUNDATION
COLLEGE OF OCCUPATIONAL THERAPY

Ethirmedu, B. KOMARAPALAYAM - 638183.Namakkal Dist,Tamilnadu, India.
Website : www.jkkm.org, e-mail :jkkm_kpm@yahoo.com

Rtn.MPHF. Dr.J.K.K. MUNIRAJAHH M.Tech., (Bolton)
Correspondent

Date :.....
19.08.2017

MOT/Project-Permission/2017

To
Mrs.R.Renuchitra, M.O.T., MDASLP
Director,
Occupational Therapy Foundation,
No.36/37, Muthusamy Street,
Erode - 638 001.

Respected Sir/Madam,

Sub: Regarding permission to project data collection.

* * *

With reference to the subject cited above, our Master of Occupational Therapy Second year student **GANAPATHY.A.** is doing project on the topic "Efficacy of Play Based Occupational Therapy in Attention Deficit Hyperactivity Disorder". He likes to collect data from your centre. So, we request you to give permission for the above student to collect the data for his project.

Thanking you,

Yours sincerely,

PRINCIPAL
JKKMMRF COLLEGE OF
OCCUPATIONAL THERAPY
KOMARAPALAYAM - 638 183

DIRECTOR
Occupational Therapy Foundation

MASTER CHART

EXPERIMENTAL GROUP

S.No	Identification Code	Age (years)	Sex	Adaptive Behavior		Communication		Daily Living		Socialization		Motor Skill	
				Pretest	Posttest	Pretest	Post test	Pretest	Post test	Pretest	Post test	Pretest	Posttest
1	E1	4.8	M	66	79	55	71	76	79	74	91	59	71
2	E2	4.9	F	67	80	57	75	73	77	79	99	59	64
3	E3	5	M	61	83	53	79	71	75	69	95	50	75
4	E4	4.6	F	74	89	89	97	60	67	64	99	82	92
5	E5	5.6	M	83	92	93	99	69	70	81	104	88	92
6	E6	6	F	82	98	87	103	81	86	83	107	75	91
7	E7	7.6	M	85	94	82	95	83	83	92	105	NA	NA
8	E8	7.9	M	94	101	92	94	113	114	81	97	NA	NA
9	E9	7.2	M	82	93	81	91	89	90	76	96	NA	NA
10	E10	7.7	M	68	86	65	87	66	74	75	93	NA	NA
11	E11	7.8	M	85	87	96	99	74	75	85	89	NA	NA
12	E12	7.8	M	100	109	100	106	105	107	106	114	NA	NA
13	E13	6.3	M	56	63	52	65	53	55	63	70	NA	NA
14	E14	5.6	M	45	59	42	62	41	44	44	64	54	65
15	E15	4.5	F	61	68	59	63	62	63	63	78	61	70

CONTROL GROUP

S.No	Identification Code	Age (years)	Sex	Adaptive Behavior		Communication		Daily Living		Socialization		Motor Skill	
				Pretest	Posttest	Pretest	Post test	Pretest	Post test	Pretest	Post test	Pretest	Posttest
16	C1	4.9	M	87	88	88	90	86	91	83	83	80	89
17	C2	4.7	M	65	65	63	63	65	69	66	67	62	64
18	C3	6.2	M	80	80	80	81	75	77	82	82	NA	NA
19	C4	6	M	96	96	90	94	97	99	92	95	106	96
20	C5	5.4	F	82	82	75	77	86	84	81	81	85	86
21	C6	4.8	M	84	84	82	83	76	76	74	75	102	104
22	C7	7.6	M	80	81	80	80	81	83	79	80	NA	NA
23	C8	7.5	M	98	98	96	96	104	104	95	95	NA	NA
24	C9	6.5	F	57	57	54	54	69	69	49	49	NA	NA
25	C10	7.4	M	46	46	45	45	53	52	42	43	NA	NA
26	C11	7.9	M	60	60	62	60	51	51	68	70	NA	NA
27	C12	6.9	M	67	67	68	68	75	73	59	61	NA	NA
28	C13	5.8	M	74	74	72	72	75	76	73	73	80	81
29	C14	6.7	M	58	59	60	61	52	54	59	59	NA	NA
30	C15	5	M	61	61	59	60	60	60	58	59	65	65

CONFIDENTIALITY

As a member of this research team, I understand that, I may have access to confidential information about the study sites and participants. I assure that, names and any other identifying information of the participants are completely confidential. I agree not to divulge any information to unauthorized persons obtained in the course of this study, unless specifically authorized persons to do so by approved protocol. I also understand that, I am not to use any confidential information from this study for my personal purpose.

The following is my name and address to be contacted in the event of any research related enquiry.

Name : GANAPATHY. A.

Address : JKKMMRF College of Occupational Therapy

Komarapalayam, Namakkal District.

CONCENT TO PARTICIPATE VOLUNTARILY IN A RESEARCH INVESTIGATION

NAME:

AGE:

SEX:

ADDRESS FOR COMMUNICATION:

DECLARATION

I have fully understood the nature and purpose of the study. I allow my child to be a subject in this study. I declare that the above information is true to the best of my knowledge.

Date: Signature of the informant

Place: